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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,127	02/22/2002	Steven Joseph King	ACUITY-029XX	8538

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EXAMINER

SETH, MANAV

ART UNIT PAPER NUMBER

2624

DATE MAILED: 09/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/081,127	Applicant(s) KING, STEVEN JOSEPH	
	Examiner Manav Seth	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6, 7, 9-16, 18, 19 and 21-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 7, 9-16, 18, 19 and 21-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment received on July 17, 2006 has been entered in full.
2. Applicant's amendment to the claims has been entered and based on the amendments objections on the respective claims have been withdrawn.
3. Applicant's arguments with respect to rejected claims as presented in the amendment filed have been fully considered but are not persuasive and therefore office still maintains the same rejections on the respective claims.

Response to Arguments

4. Applicant's arguments regarding the prior art rejections under Takeuchi, Kley and (Kubisiak or Ausschnitt) have been fully considered but are not persuasive.
5. In pages 10-19 of the amendment filed on July 17, 2006, Applicant argues in substance:
 - a. **There is no motivation to combine Takeuchi and Kley in view of the claim 1.**

Examiner respectfully disagrees. First of all, examiner directs applicant to the rejection of the claim 1 where the rejection of the claim 1 is made with respect to the references Takeuchi, Kley and (Kubisiak or Ausschnitt), rather than just Takeuchi and Kley and thus the arguments presented are not complete and proper. Now, concentrating on the claim 1, claim 1 recites two parts:

Part (a) Generation of electronic images of an object under illumination with lights of different frequencies, which recites the claim limitations “illuminating a target (specimen) with at least a first visible light spectrum illumination source, taking a first image of the target using an image recording device, illuminating the target with at least a second ultraviolet illumination source, taking at least a second image of the target using said image recording device” and then

Part (b) Computer processing of those generated electronic images, which recites the limitations “processing the first and at least a second image using a data processing device and extracting information of interest about the target comprising the determination of an edge of at least a portion of the target”.

In rejection of claim 1, as cited Takeuchi clearly part (a) by teaching the generation of electronic images of an object under illumination with lights of different frequencies and here it being visible light and ultraviolet light and as cited further teaches observing the specimen or the target by displaying the electronic images generated on the display.

As disclosed in the rejection of claim 1 previously, Takeuchi does teach of generating electronic images of an object for observing the specimen or target in the images on the monitor but does not expressly teach of further extracting information of interest about the target or specimen from the first and second images using a data processing device. Takeuchi does not expressly teach part (b) and therefore examiner relies on Kley and (Kubisiak or Ausschnitt) in order to teach part (b).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion,

or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Kley as cited, not only teaches generation of electronic images of an object under illumination with lights of different frequencies but also teaches that these electronic images further can be processed using a data processing device to extract information of interest about the object and here the information of interest being the dimensional information (width and length) of the object and apparently width and length if known would totally identify the edges of the object. As cited before, also Kley does recognize an advantage or fact that illumination under different frequencies of an object would impact the determination of an identity of an property of the object (col. 42, lines 56-68). **Examiner further adding emphasis** asserts that since the images being electronic images any image processing functions as applicable can be applied to any electronic images in order extract the desired information from the image despite of the illumination sources used. (Kubisiak or Ausschnitt) is relied to provide the determination of an edge of a target by processing the electronic images. Thus examiner relies on Kley and (Kubisiak or Ausschnitt) to provide the teachings of part (b) of extracting information of interest about an object or target from electronic images, which would obviously further enhance the observation or analysis of the target or specimen observed in the invention of Takeuchi, when combined.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed

invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Applicant in second paragraph of page 16 of the amendment filed argues in substance that, "Kley provides no suggestion of using ultraviolet light". Examiner respectfully asserts that Examiner does not rely on Kley to provide such a teaching as Takeuchi provides such a teaching. Therefore, applicant's arguments with respect to all the rejected claims are not persuasive and office still maintains the same rejections on the respective claims.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2-4, 6, 9, 11-12, 15-16, 18, 21, 23-24, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al., U.S. Patent No. 6,337,767, in further view of Kley, U.S. Patent No. 4,806,776 and further in view of Kubisiak et al., U.S. Patent No. 3,710,128.

Regarding claim 1, Takeuchi discloses illuminating a target (specimen) with at least a first visible light spectrum illumination source, taking a first image of the target using an image recording device, illuminating the target with at least a second ultraviolet illumination source, taking at least a second image of the target using said image recording device (col. 7, lines 20-30; col. 8, lines 1-36, images generated from the electrical signals for observation of the specimen (target) on the monitor

(col.8, lines 24-25)). Takeuchi does teach taking images under different frequencies of light and then observing the specimen in the images on the monitor but does not expressly teach of processing said first image and at least a second image using a data processing device and extracting information of interest about the target. However, Kley discloses processing first and at least a second image using a data processing device and extracting information of interest (col. 37, lines 22-60; figures 81-100; col. 38, lines 47-60; In a variation illustrated in figure 83, a computer 1376 samples and processes the video signal from the television camera 1340 and displays processed video signals on monitor 1358. The computer 1376 is programmed to form differential images by digital techniques from successive frames of the video signal from television camera 1340. One particular application of the electronic illumination control employing oblique light units 1352 and 1354 to illuminate an object such as a printed circuit board 1378 is shown in fig. 84. The use of alternate light units wherein at least one of the units is oblique, produces differential images which contain information regarding the height of the structures of the object in addition to the normal two-dimensional information concerning width and length of structure in the object being viewed). Therefore, it would have been obvious for one of ordinary skill in the art at the time of invention was made to combine the teachings of Takeuchi and Kley because both references are directed to the object (or target) observation under different light sources of different frequencies and both Takeuchi and Kley teaches the use of microscope to observe the specimen (or target) and Kley further provides the more versatility by teaching "that all of the variations and modifications of illumination control in connection with a microscope are also applicable to video systems or systems wherein an electronic signal is generated indicative of the object being viewed (col. 36, lines 20-28) and Kley further discloses illuminating the object (target) using different frequencies of illumination sources and utilizing the reflected illumination to determine the identity of a property (dimensional

information, as discussed before) of the object (col. 42, lines 56-68) where apparently both visible and ultraviolet light sources can be used as they are light sources of different frequencies, therefore providing the versatile usage of using light sources of different frequencies in the inspection of object's properties and Kley's invention provides the possible versatile use (application) of the teachings provided by Takeuchi.

As discussed above the combined invention of Takeuchi and Kley discloses determining the dimensional information of the object from the information extracted from the object images but does not expressly teach "comprising the determination of an edge of at least a portion of the target". It is clear from the above disclosure by Kley, that Kley determines width and length of the object and as well known these two parameters totally identify the edges of the object. However, Kubisiak discloses determining an edge of the object from the image signals where the object being illuminated using two different light sources (col. 9, lines 59-68 through col. 10, lines 1-16; col. 2, lines 47-55; col. 3, lines 35-65; col. 4, lines 43-68 through col. 5, lines 1-40). Therefore it would have been obvious for one of ordinary skill in the art at the time of invention was to use Kubisiak's teachings in the combined invention of Takeuchi and Kley because the references are directed to measuring the dimensions of the object under different illumination sources and Kubisiak's method of determining edge of the object would provide a better accuracy (See Kubisiak, col. 2, lines 35-46).

Regarding claims 2-4, as discussed in the rejection of claim Kley discloses "In a variation illustrated in figure 83, a computer 1376 samples and processes the video signal from the television camera 1340 and displays processed video signals on monitor 1358. The computer 1376 is programmed to form differential images by digital techniques from successive frames of the video signal from television camera 1340" (col. 37, lines 22-60; figures 81-100; col. 38, lines 47-60).

Claim 6 recites “the method of claim 3 wherein processing said first and at least a second image using a data processing device comprises superpositioning of the first image and the second image”. Kubisiak discloses superpositioning of the two image signals (col. 4, lines 43-68 through col. 5, lines 1-40).

Regarding claim 9, Takeuchi discloses the act of providing a filter disposed between the target and the at least a second illumination source to block visible light. (Figure 5; col. 8, lines 11-13, “under ultraviolet ray observation with DUV light, **the illumination light becomes only ultraviolet light by UV filter 151**”).

Claim 11 recites “the method of claim 1 further comprising the act of providing a filter disposed between the camera and the target”. Kley discloses “In alternative embodiments the color control unit 1446 can have additional frequency **band pass filters**, or can have band pass filters for non-visible frequencies such as infrared or ultraviolet light **where the camera 1340 is sensitive to such radiations (col. 39, lines 22-30)**. The instant invention **recites the use** of well-known band pass filters to block a particular spectrum of light, not the design of these band pass filters. The use of band pass filters is very well known to be used to in front of cameras and light sources to block a particular spectrum of frequencies and it depends on user’s specific design choice of selecting the band pass filter depending on what frequency band to be blocked and what needs to be passed on. Also, Takeuchi discloses the same in figures 2 and 5.

Claims 12 has been similarly analyzed and rejected as per claim 11.

Claims 15 and 16 have been similarly analyzed and rejected as per claims 1-4.

Claim 18 has been similarly analyzed and rejected as per claim 6.

Claim 21 has been similarly analyzed and rejected as per claim 9.

Claims 23-24 have been similarly analyzed and rejected as per claims 11, 12 and 15.

Regarding claim 28, However, Takeuchi teaches such a filter which blocks visible light, and a filter which blocks ultraviolet light disposed between the imaging device and target (col. 3, lines 25-35; col. 8, lines 1-26). All other limitations of claim 28 have been similarly analyzed and rejected as per claims 1-4.

Claim 29 has been similarly analyzed and rejected as per claims 1-4 and 11-12.

8. Claims 1, 15, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al., U.S. Patent No. 6,337,767, in further view of Kley, U.S. Patent No. 4,806,776, and further in view of Ausschnitt et al., U.S. Patent No. 5,914,784.

Regarding claims 1, 15, 28 and 29, Takeuchi discloses illuminating a target (specimen) with at least a first visible light spectrum illumination source, taking a first image of the target using an image recording device, illuminating the target with at least a second ultraviolet illumination source, taking at least a second image of the target using said image recording device

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(col. 7, lines 20-30; col. 8, lines 1-36, images generated from the electrical signals for observation of the specimen (target) on the monitor (col.8, lines 24-25)). Takeuchi does teach taking images under different frequencies of light and then observing the specimen in the images on the monitor but does not expressly teach of processing said first image and at least a second image using a data processing device and extracting information of interest about the target. However, Kley discloses processing first and at least a second image using a data processing device and extracting information of interest (col. 37, lines 22-60; figures 81-100; col. 38, lines 47-60; In a variation illustrated in figure 83, a computer 1376 samples and processes the video signal from the television camera 1340 and displays processed video signals on monitor 1358. The computer 1376 is programmed to form differential images by digital techniques from successive frames of the video signal from television camera 1340. One particular application of the electronic illumination control employing oblique light units 1352 and 1354 to illuminate an object such as a printed circuit board 1378 is shown in fig. 84. The use of alternate light units wherein at least one of the units is oblique, produces differential images which contain information regarding the height of the structures of the object in addition to the normal two-dimensional information concerning width and length of structure in the object being viewed). Therefore, it would have been obvious for one of ordinary skill in the art at the time of invention was made to combine the teachings of Takeuchi and Kley because both references are directed to the object (or target) observation under different light sources of different frequencies and both Takeuchi and Kley teaches the use of microscope to observe the specimen (or target) and Kley further provides the more versatility by teaching "that all of the variations and modifications of illumination control in connection with a microscope are also applicable to video systems or systems wherein an electronic signal is generated indicative of the object being viewed (col. 36, lines 20-28) and Kley further discloses illuminating the object (target)

using different frequencies of illumination sources and utilizing the reflected illumination to determine the identity of a property (dimensional information, as discussed before) of the object (col. 42, lines 56-68) where apparently both visible and ultraviolet light sources can be used as they are light sources of different frequencies, therefore providing the versatile usage of using light sources of different frequencies in the inspection of object's properties and Kley's invention provides the possible versatile use (application) of the teachings provided by Takeuchi.

As discussed above the combined invention of Takeuchi and Kley discloses determining the dimensional information of the object from the information extracted from the object images but does not expressly teach "comprising the determination of an edge of at least a portion of the target". It is clear from the above disclosure by Kley, that Kley determines width and length of the object and as well known these two parameters totally identify the edges of the object. However, Ausschnitt discloses "determination of the location of the object edge may include comparing the image signal profiles of the object edge at the different phases or different light colors" (col. 3, lines 47-50) where different color light belong to different light frequencies. Therefore, it would have been obvious for one of ordinary skill in the art at the time invention was made to use Ausschnitt's teachings in the combined invention of Takeuchi and Kley because the references teach evaluation of the object under different lighting conditions. Kley does teach measuring the dimensions of the object and Ausschnitt's teaching's further provide the improved method of detecting and measuring edges of features which would produce sharper edges (See Ausschnitt, col. 3, lines 2-6).

9. Claims 7, 19 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al., U.S. Patent No. 6,337,767, in further view of Kley, U.S. Patent No. 4,806,776 and further in

view of Kubisiak et al., U.S. Patent No. 3,710,128, and further in view of a printed article from Archive.org, 2000, "Nerlite DOAL and COAL Illuminators" (here Nerlite) (pp. 1-3).

Regarding claims 7 and 19, Claims 7 and 19 recites "the first illumination source comprises using a diffuse on-axis light source". As discussed in the rejection of claim 1, Kley suggests of using different kinds of light sources and examiner further asserts that "diffuse on-axis light source" (DOAL) is very well-known to be used for illumination purposes. Examiner took official notice for this well known light source and here by provides the reference (Nerlite from archive.org) which further provides motivations to use DOAL, by teaching "With the DOAL's illumination, light rays reflect off a beam splitter on to an object at nearly 90 degrees and further providing uniform light output eliminating glare and shadows and this provides standard use of DOAL in applications that involve the inspection of objects with reflective surfaces" (Nerlite, pages 1-3). Therefore, in view of the above cited advantages of DOAL with respect to reference Nerlite, it would have been obvious for one of ordinary skill in the art at the time of invention was made to use DOAL in the combined invention of Takeuchi, Kley and Kubisiak.

Claim 27 has been similarly analyzed and rejected as per claims 1-4 and 7.

10. Claims 10 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al., U.S. Patent No. 6,337,767, in further view of Kley, U.S. Patent No. 4,806,776 and further in view of Kubisiak et al., U.S. Patent No. 3,710,128, and further in view of Murnaghan Instruments (hereinafter **Murnaghan**), 1999, "UV35 Ultraviolet Passing – Visible blocking CCD filter".

Claim 10 recites "the method of claim 9 wherein the filter blocks wavelengths of lights greater than 390 nanometers". Kley does not teach a filter that blocks wavelengths of light greater

than 390 nanometers. Ultraviolet pass camera filters are general service filters that block ultraviolet light, which can cause a hazy look, and serve to protect more expensive lenses. However, Murnaghan does teach a filter, that blocks wavelengths of light greater than 390 nanometers (page 2, line 1, "Transmittance ends: 390nm"). Therefore, it would have been obvious for one of ordinary skill in the art to use Murnaghan's filter in the invention of Kley as it would block visible spectrum and despite of the fact where it is used would block visible spectrum and pass ultraviolet light.

Claim 22 has been similarly analyzed and rejected as per claims 10 and 21.

11. Claims 13-14 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al., U.S. Patent No. 6,337,767, in further view of Kley, U.S. Patent No. 4,806,776 and further in view of Kubisiak et al., U.S. Patent No. 3,710,128, and further in view of **Schneider** Optics, 1999, "Filters for Motion pictures and television".

Claim 13 recites "the method of claim 12 wherein the filter blocks light less than 410 nanometers". As discussed in claim 11, both Takeuchi and Kley does teach blocking ultraviolet light but does not specifically teach blocking light less than 410 nanometers. It is well known that ultraviolet light and visible light are part of the light spectrum where ultraviolet light range starts from 400nm and goes lower and visible light range starts at 400nm to 700nm. The violet color in the visible range lies at the intersection of 400nm and practically between 390nm and 410nm such that violet being a part of ultraviolet as well as visible range. Therefore, taking this concept in consideration, inventors have been using band pass filters that completely blocks ultraviolet light which is less than 410 nanometers where specifically and completely blocking only visible light which is greater than 390nm where specifically ultraviolet based imaging is required, for better

accuracy of images. Schneider further teaches such a ultraviolet blocking filter UV-410 which filters out ultraviolet light below 410nm (page 20, lower right hand corner). Therefore, it would have been obvious for one of ordinary skill in the art to use Schneider's ultraviolet filter in the invention of Kley as Schneider's filter would filter out ultraviolet light below 410 nm, blocks the blue cast, penetrates haze and permits to capture vivid colors and shaper detail.

Claim 14 recites "the method of claim 13 wherein the filter blocks at least one portion of the visible light spectrum". Claim 14 has been similarly analyzed and rejected as per claim 13.

Claims 25 and 26 have been similarly analyzed and rejected as per claims 13-15 and 23.

Conclusion


12. **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Manav Seth whose telephone number is (571) 272-7456. The examiner can normally be reached on Monday to Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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Manav Seth
Art Unit 2624
September 22, 2006